



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,562	11/25/2003	Benjamin A. Leis	MSFT-2786/305794.1	5808
41505 7590 12/22/2006 WOODCOCK WASHBURN LLP (MICROSOFT CORPORATION) CIRA CENTRE, 12TH FLOOR 2929 ARCH STREET PHILADELPHIA, PA 19104-2891			EXAMINER DINH, NGOC V	
			ART UNIT 2189	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/22/2006	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/721,562	<b>Applicant(s)</b> LEIS ET AL.	
	<b>Examiner</b> NGOC V. DINH	<b>Art Unit</b> 2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/31/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is a response to the U.S. application Serial No. 11/721562 filed on 11/25/03. Claims 1-23 are presented for examination.

### **INFORMATION DISCLOSURE STATEMENT**

2. The Applicant's submission of the IDS filed 03/31/04 have been considered. As required by M.P.E.P. 609 C(2), a copy of the PTOL-1449 is attached to the instant office action.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 20-22 are rejected under 35 USC-101.

Claims 20-22 recite "computer-readable medium". However, in view of applicants' disclosure, specification page 5, [0021], the medium is not limited to tangible embodiments, instead being defined as including both tangible embodiments (e.g., CD-ROM, EEPROM) and intangible embodiments (e.g., communication media), which are not statutory.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Art Unit: 2189

4. Claims 1-4, 7-8 are rejected under 35 U.S.C.102 (e) as being anticipated by Carter et al. US 2004/0091114.

Carter teaches:

**Per claim 1**, a system for providing a computing environment, the environment including a virtual memory [page 3/[0032]], the system comprising: a virtual memory manager [a paging system 1320, which is part of a virtual memory system, page 15/[0203-0204]] that provides the virtual memory by moving or copying data between a volatile memory and a paging file [The theoretical virtual page parameter x shall separate how each EOS kernel shall select its page size to load and unload data from the secondary physical storage medium ("the hard disk"). The parameter "x" shall denote the size of each page partition, where each partition shall be based upon the size of the physical limitations of the computer platform's random access memory (RAM, DRAM, etc.), page 15/[0207]; Virtual Page, page 15/[0210]] stored in a hard disk, the system protecting the contents of the virtual memory by encrypting the data stored in the paging file [The EOS (Encrypting operating system) is configured to use a symmetric encryption algorithm and an encryption key to encrypt data transferred from physical memory to secondary devices, such as disks, swap device, network file systems, network buffers, pseudo file systems, or any other structures external to the physical memory and on which can data can be stored; abstract; page 4/[0054]; fig. 15, page 15/[0208]; page 15[0203-0204]; Encrypted File System, page 7/[0105]].

**Per claim 2**, the virtual memory manager communicates the data to a file system, wherein the file system causes the data to be encrypted prior to storing the data in the paging file [encrypting and decrypting data transferred between a computer's physical memory and a secondary device, page 2/[0014]; page 2/[0019]; page 11/[0163-0164]].

**Per claim 3**, the file system marks the paging file for encryption, and wherein the paging file, upon receiving a request to store the data in the paging file, determines that the paging file has been marked for encryption and communicates with an encryption component [EOS, page 4/0558, 0069] to encrypt the data [the EOS provides the following additional functions: (1) it

Art Unit: 2189

creates secured files by encrypting data; (2) it prevents the mass removal of files; (3) it provides authenticated authorized access to secured files, for opening, reading, and writing; (3) it provides authenticated authorization for seeking within a file; (5) it ensures that when files are closed, and thus written back to disk, the files are encrypted; (6) it encrypts secured directories, thus securing them; (7) it prevents the unauthorized listing of directories; and (8) it controls access to the encrypted file names (i.e., the contents of the directories), thus preventing the unauthenticated and unauthorized removal of the encrypted files, page 6/[0097]].

**Per claim 4**, a key generator [724, fig. 7] that generates a session key, the session key being used to encrypt the data, and the session key being further needed for subsequent decryption of the encrypted data [page 6/[0097]; page 9/[0122]; page 10/[0129]].

**Per claim 7**, encryption of the data is performed according to one or more of the following algorithms: Data Encryption Standard (DES); Triple-DES (3DES); or Advanced Encryption Standard (AES) [page 1/[0006-0007]].

**Per claim 8**, the system further protects the contents of the virtual memory by ensuring that all user mode applications and data that are stored in the virtual memory are encrypted when being stored in the paging file [abstract; page 2/[0019]].

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5, 9-10, 12, 14-15, 18, 20, 23 are rejected under 35 U.S.C 103(a) as being unpatentable over Carter, and in view of Challener et al. us 2003/0188179.

**Per claim 5:** Carter does not teach the session key is non-persistently stored in a manner that causes the session key to become unavailable in the event that a boot occurs after generation of the session key.

Challener teaches the session key is non-persistently stored in a manner that causes the session key to become unavailable in the event that a boot occurs after generation of the session key [page 6/claim 4].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Challener to Carter so that the encryption key is not directly accessible to the application, thus guaranteeing the OS or other programs running on the system are not provided with access to and cannot "grab" the crypto keys and also cannot save data in memory locations to which they do not have authorization [page 5/[0054]].

**Per claims 9, 14, 20, 23:** Carter teaches the claimed limitations as mentioned in claim 1 and further teaches: said file system causing said contents to be encrypted with a key prior to storing said contents in said paging file [see claims 1-4 above], said key being required to decrypt information contained in said paging file [page 4/[0054]].

Carter does not teach: said key being stored in a manner such that a reboot of a machine on which said key is stored causes said key to be lost.

Challener teaches the encryption key being stored in a manner such that a reboot of a machine on which said key is stored causes said key to be lost [see claim 5 above].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Challener to Carter for the same reason provided above.

**Per claim 10,** generating said key upon a boot of said machine [bootstrap code, page 17/[0218]].

**Per claim 12,** the file system causes said contents to be encryption by communicating with an encryption component, the encryption component encrypting files that have been marked by the file system for encryption [page 4/0058, 0068]].

**Per claim 15**, the encryption component reserves a block of memory upon startup [page 11/[0164]].

**Per claim 18**, said key is generated before said virtual memory manager directs the storage of data into the paging file [data transmitted to the sockfs file system, and thus over a socket connection, is encrypted before it is transmitted from the physical memory of a computer system over the socket connection, page 14/[0202]].

Claims 6, 19, 22 are rejected under 35 U.S.C 103(a) as being unpatentable over Carter, in view of Challener et al., and further in view of Masui et al US 2004/0190714.

**Per claims 6, 19, 22:** Carter and Challener do not teach protects the contents of the virtual memory by ensuring that there is no persistent storage of the session key.

Masui teaches the encryption key is stored in a volatile memory [page 1[0014]].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Masui to Carter-Challener for the reason provided above.

Claims 11, 13, 16-17, 21 are rejected under 35 U.S.C 103(a) as being unpatentable over Carter-Challener.

**Per claims 11, 13:** Carter-Challener does not teach prior to generation of said key, reserving a block of said volatile memory for use as a workspace, whereby use of the workspace avoids the need to copy volatile memory contents to disk prior to generation of the session key. Reserving a block of said volatile memory in which data may be passed back and forth between the file system and the encryption component.

However, It would have been obvious to one having ordinary skill in the art at the time the invention was made because reserving a block of said volatile memory in which data may be passed back and forth between the file system and the encryption component for use as a workspace prior to generation of said key in an encrypted manner in order to render cracking the

Art Unit: 2189

encryption key more difficult. Since the encryption key is stored in a particular block of the volatile memory (instead of scattering over different blocks), this make the encryption key being easy to control and protect.

**Per claims 16-17, 21:** Carter-Challener does not teach:

- a) the block of memory is used as a buffer to pass information between the file system and the encryption component, and as a workspace for the encryption component prior to generation of said key;
- b) whereby sufficient space for storage of said encryption component's operating data exists in said volatile memory prior to generation of said key.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made because: a) buffer is a well-known feature in the art that can queue incoming or outgoing data while the destination is busy executing previous data/instruction. In doing so, data being transferred is not lost since the buffer can temporary store the data until the destination is free; b) as stated in claim 5 above storing encryption key in volatile memory will prevent encryption key from being “grap”.

### ***Conclusion***

**Any response to this action should be mailed to:**

Under Secretary of Commerce for intellectual Property and Director of the  
United States Patent and Trademark Office  
PO Box 1450

Alexandria, VA 22313-1450

**or faxed to:**

(571) 273-8300, (for Official communications intended for entry)

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PMR) system. Status information for published Applications may be obtained from either Private PMR or Public PMR. Status information



Art Unit: 2189

for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pak-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc Dinh whose telephone number is (571) 272-4191. The examiner can normally be reached on Monday-Friday 8:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon, can be reached on (571) 272-4204.

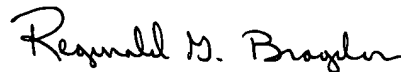


NGOC DINH

Patent Examiner

ART UNIT 2189

December 12, 2006



REGINALD BRAGDON  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100